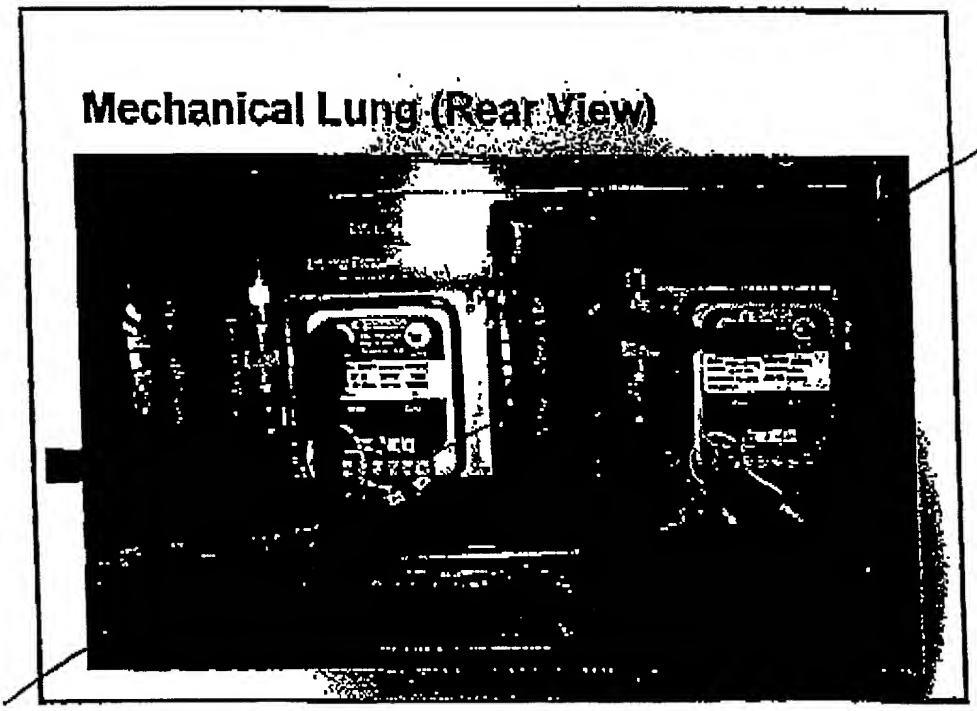

Mechanical Lung (Rear View)

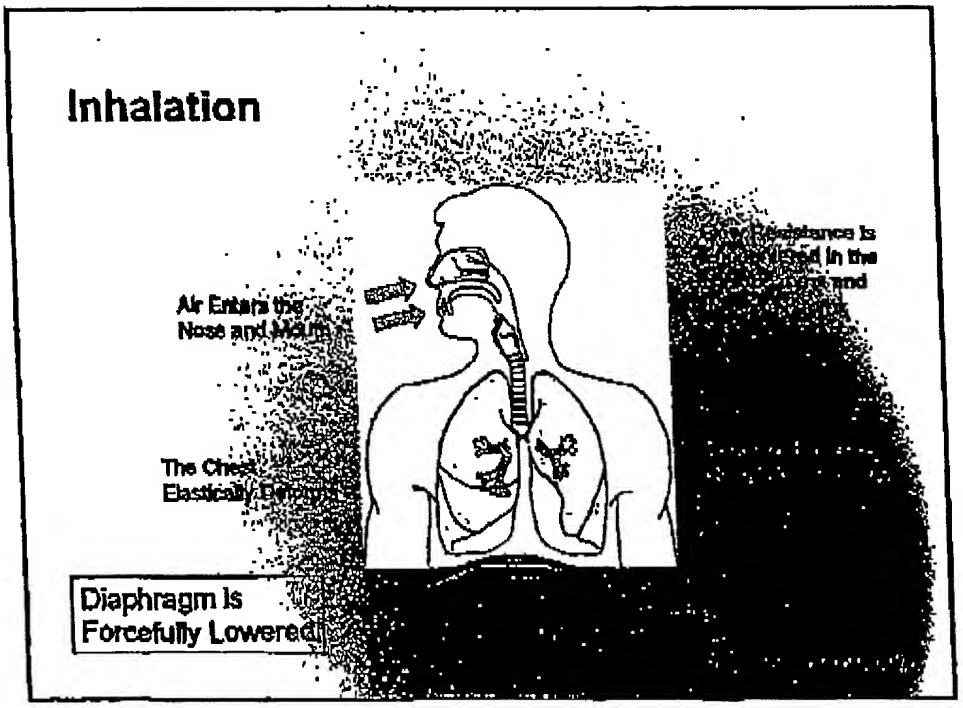

Inhalation
Air Enters the Nose and Mouth
The Chest Elastically Expands
Diaphragm is Forcefully Lowered

FIG. 1

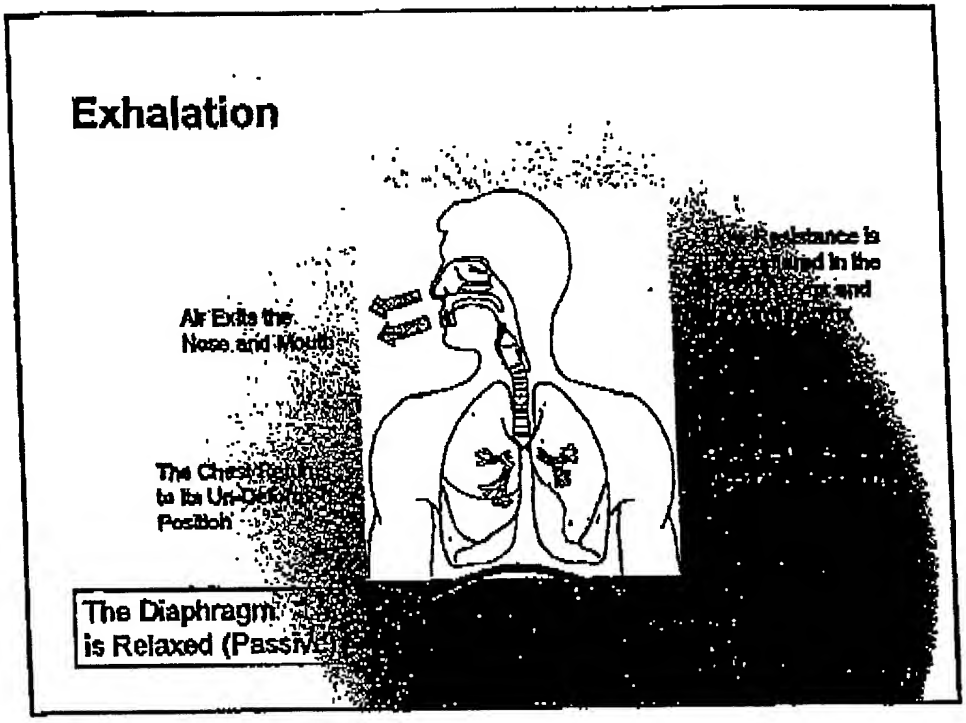
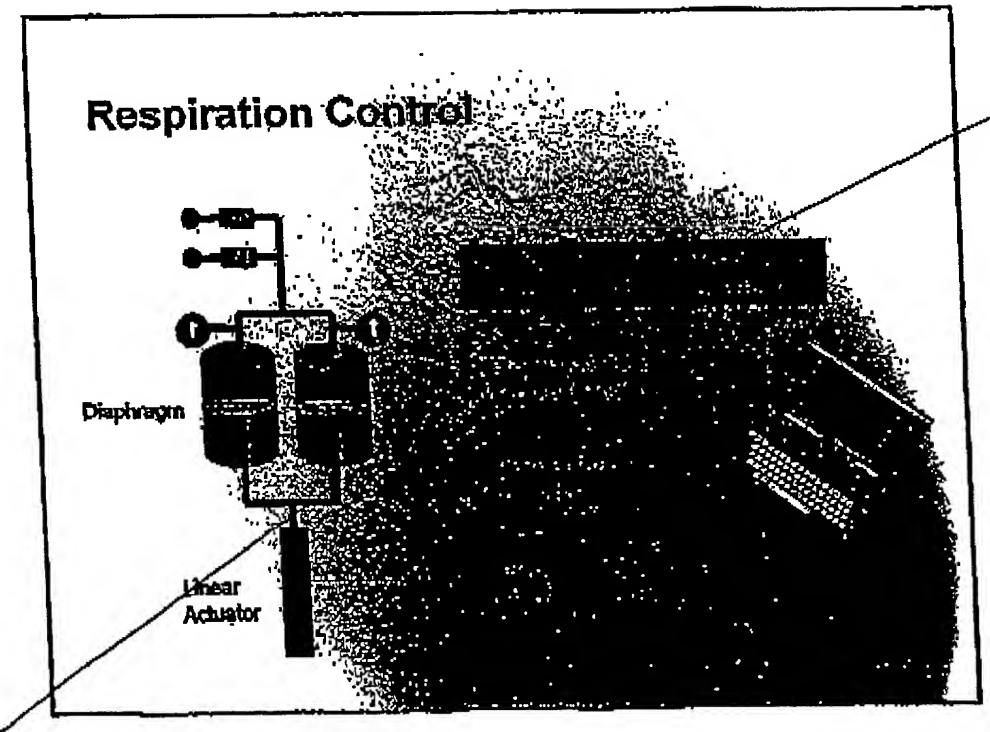

Exhalation
Air Exits the Nose and Mouth
The Diaphragm is Relaxed (Passive)

FIG. 2


Respiration Control
Diaphragm
Linear Actuator

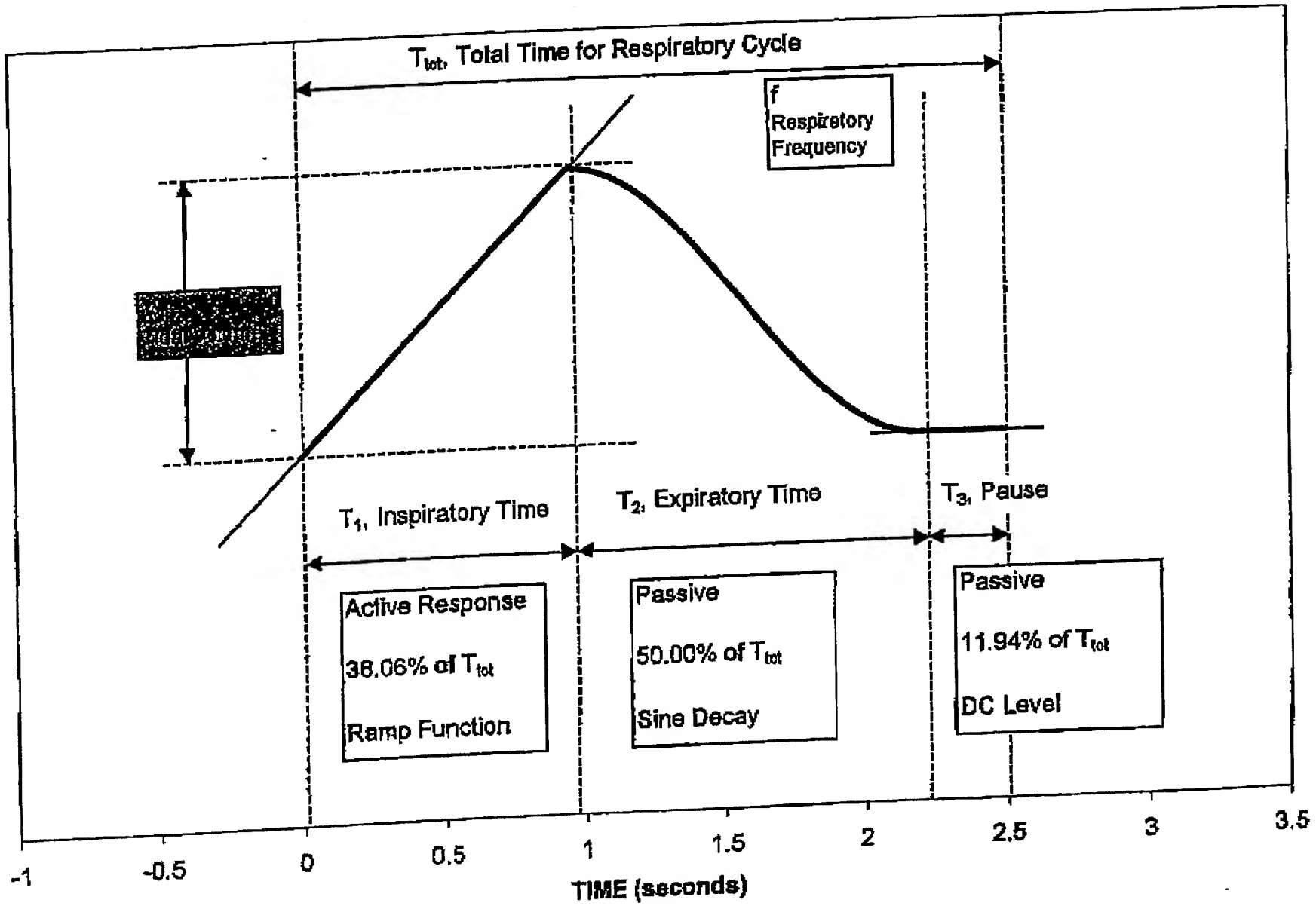


FIG. 3

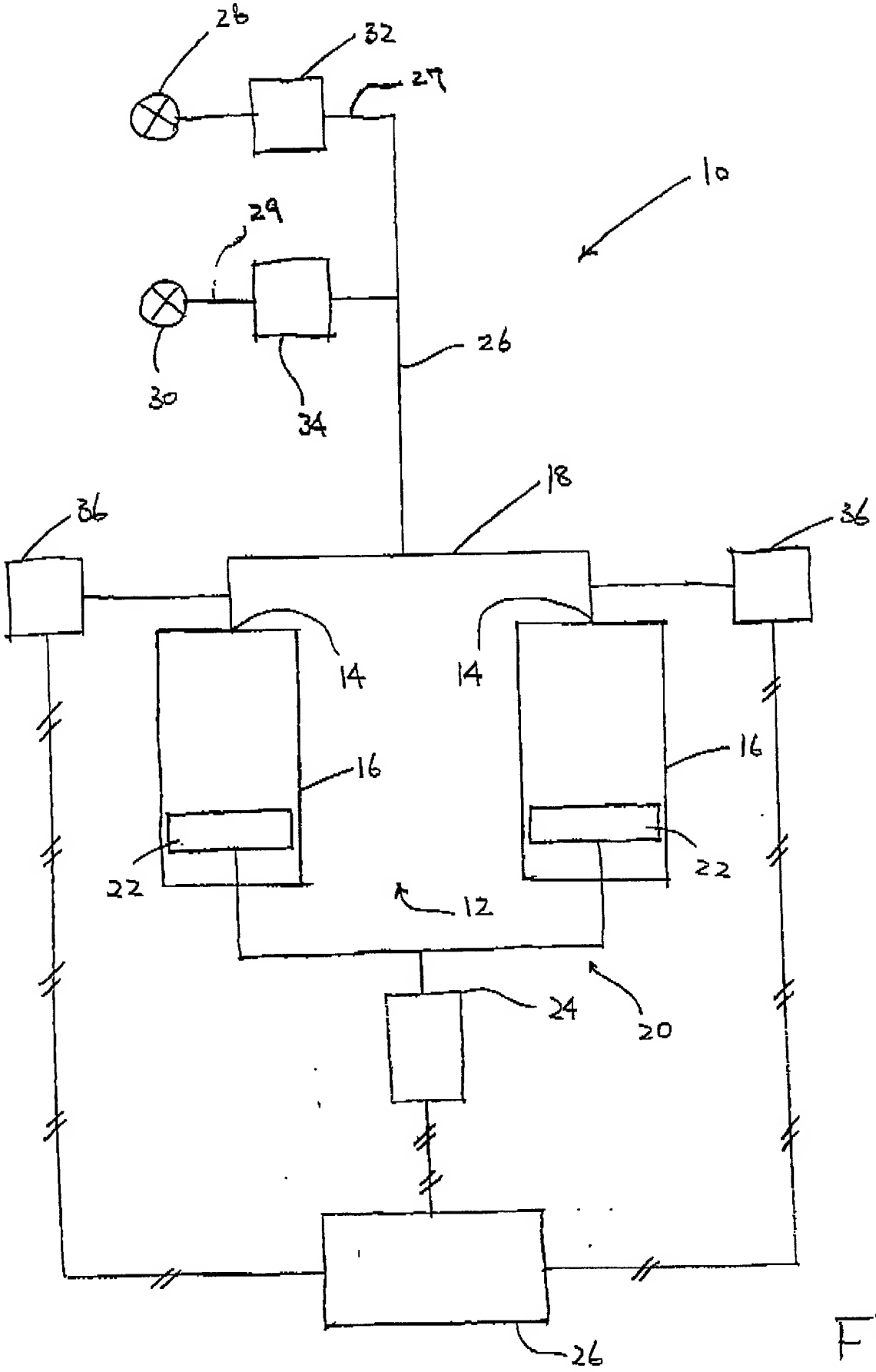


FIG. 4

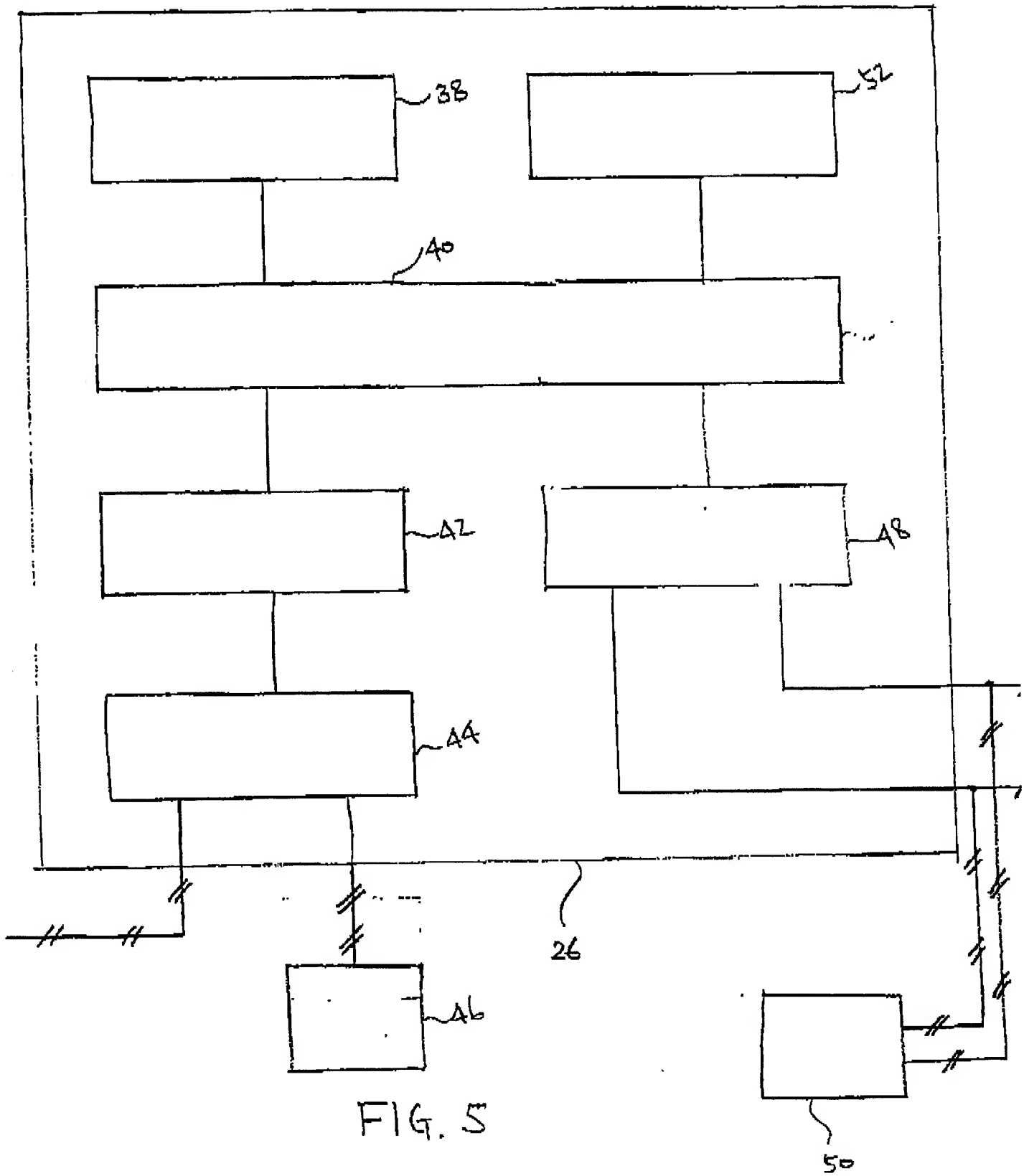


FIG. 5

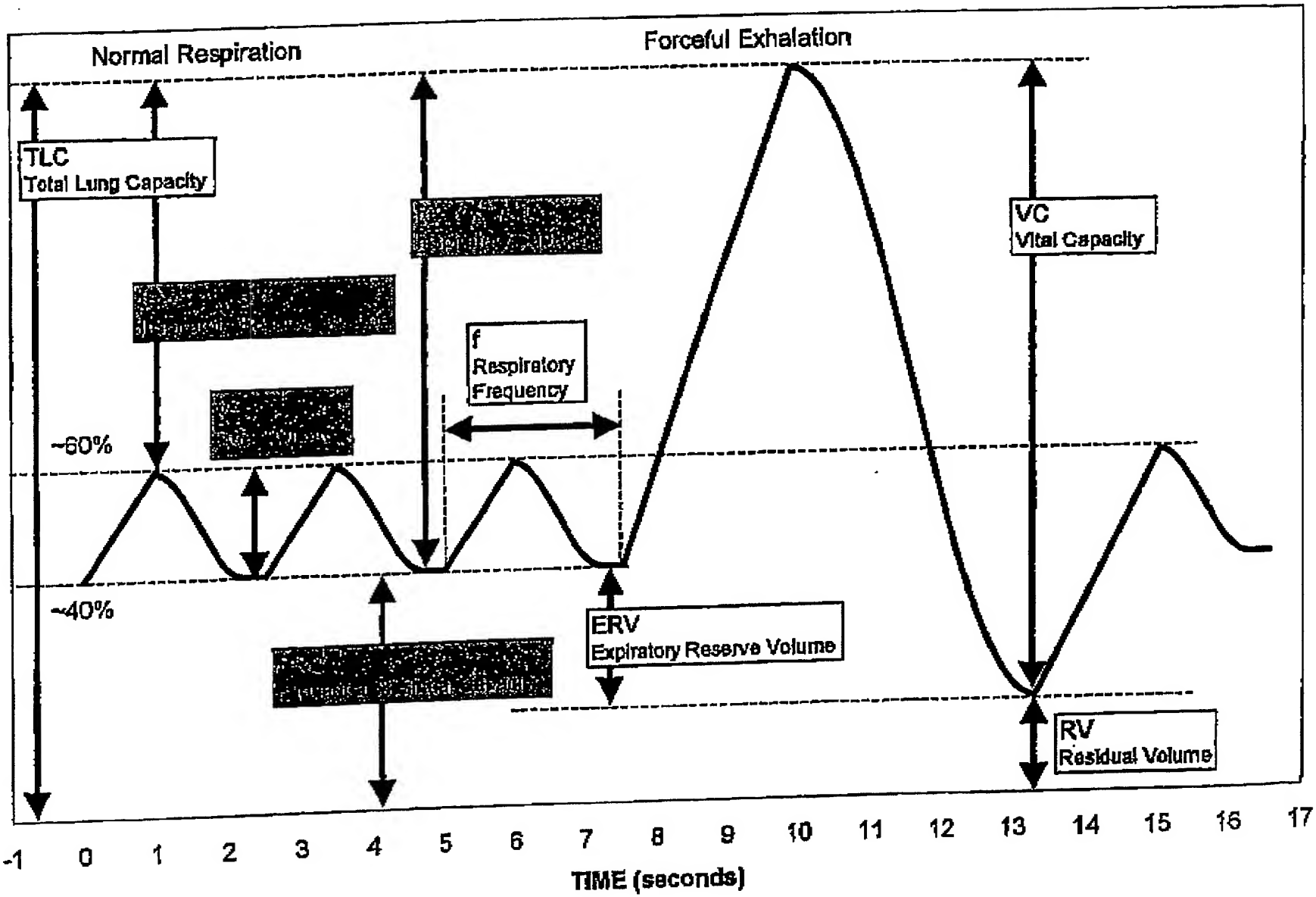


FIG. 6

			AGE (years)											
			1	2	3	4	5	6	7	8	9	10	11	12
Lung Capacity														
Total Lung Capacity	TLC	(ml)	633	923	1213	1340	1467	1802	2138	2473	2788	3123	3448	3773
Vital Capacity	VC	(ml)	475	693	910	1005	1100	1352	1603	1855	2099	2343	2586	2830
Residual Volume	RV	(ml)	158	231	303	335	367	451	534	618	700	781	862	943
TLC = VC + RV														
RV = 0.25 * TLC														
Normal Respiration														
Functional Residual Capacity	FRC	(ml)	263	388	532	596	660	831	1003	1174	1344	1515	1685	1855
Tidal Volume	VT	(ml)	78	95	112	121	130	147	163	180	200	220	240	260
Inspiratory Capacity	IC	(ml)	370	526	681	744	807	971	1135	1299	1454	1609	1764	1919
Inspiratory Reserve Volume	IRV	(ml)	292	431	569	623	677	824	972	1119	1254	1388	1524	1658
Frequency (cycles/minute)	f		24	23	22	21	20	19	19	18	18	17	17	16
TLC = FRC + IC														
TLC = FRC + VT + IRV														
IC = VT + IRV														
FRC = 0.50 * TLC (upright)														
FRC = 0.40 * TLC (supine)														
Forceful Exhalation														
Expiratory Reserve Volume	ERV	(ml)	105	167	228	281	293	361	468	556	645	734	823	913
Frequency (cycles/minute)	f													
TLC = IC + ERV + RV														
VC = ERV + IC														

Calibration (Model Lungs and Linear Actuator)			Position (inches)	Voltage (V)	Volume (ml)	Tot Volume (ml)
Baseline (0.00-inches, 0.0 volts)			0.00	0.00	80	160
Fully Extended (6.00-inches, 5.0 volts)			6.00	5.00	995	1990
V/ml					0.0055	0.0027
ml/V					183	368

Note: Volume = the volume of 1 lung, Tot Vol = the volume of both lungs

Enter values at "red" text only.

Normal Respiration Cycle													
Total Time (1 Respiration Cycle)	Ttot	(sec)	2.588	2.609	2.727	2.857	3.000	3.103	3.214	3.333	3.429	3.529	3.636
Inspiratory Time (TI), Ramp, 38.05%	T1	(sec)	0.952	0.993	1.038	1.087	1.142	1.181	1.223	1.269	1.305	1.343	1.384
Expiratory Time (TE-T3), Sine Decay, 50%	T2	(sec)	1.250	1.304	1.364	1.429	1.500	1.552	1.607	1.667	1.714	1.765	1.818
Pause (TE-T2), DC Level, 11.94%	T3	(sec)	0.299	0.311	0.325	0.341	0.358	0.371	0.384	0.398	0.409	0.421	0.434
Programming Settings:													
RAMP													
Start	RS	(V)	0.2814	0.5489	1.0164	1.1913	1.3661	1.6342	2.3024	2.7705	3.2357	3.7008	4.1660
End	RE	(V)	0.4945	0.9085	1.3224	1.5218	1.7213	2.2350	2.7486	3.2623	3.7621	4.3019	4.8217
SINE													
Amplitude	SA	(V)	0.1066	0.1298	0.1530	0.1653	0.1776	0.2004	0.2231	0.2458	0.2732	0.3005	0.3279
Offset	SO	(V)	0.3880	0.7787	1.1694	1.3566	1.5437	2.0348	2.5255	3.0164	3.5089	4.0014	4.4939
Freq (Hz)	SF	(Hz)	0.4000	0.3833	0.3667	0.3500	0.3333	0.3222	0.3111	0.3000	0.2917	0.2833	0.2750
Phase	SP	(deg)	90	90	90	90	90	90	90	90	90	90	90
DC LEVEL													
Offset	DO	(V)	0.2814	0.5489	1.0164	1.1913	1.3661	1.6342	2.3024	2.7705	3.2357	3.7008	4.1660

FIG. 7

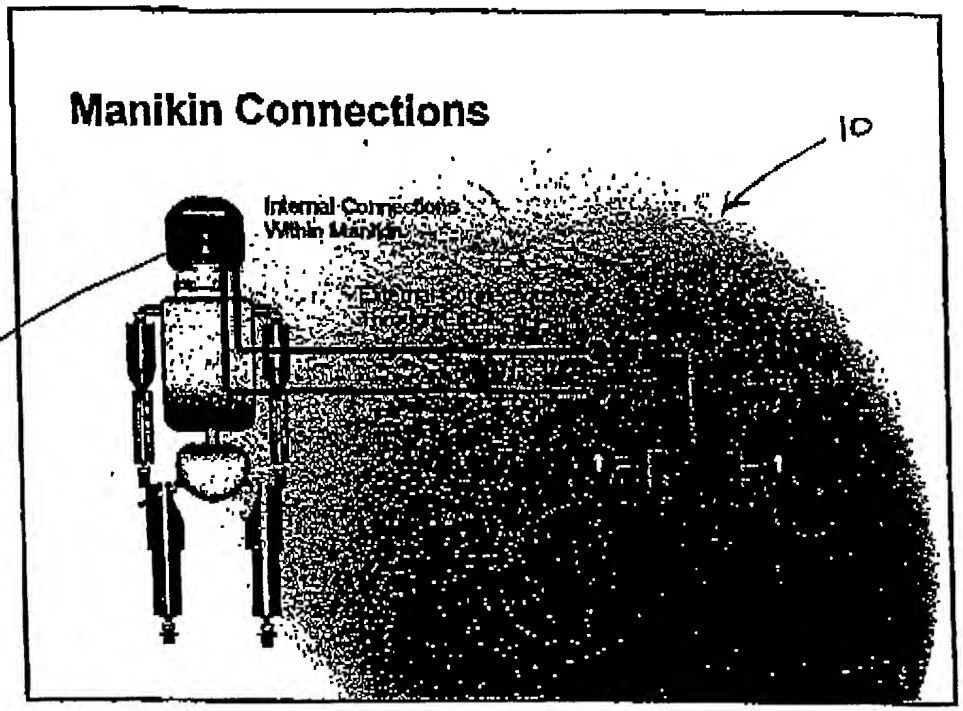
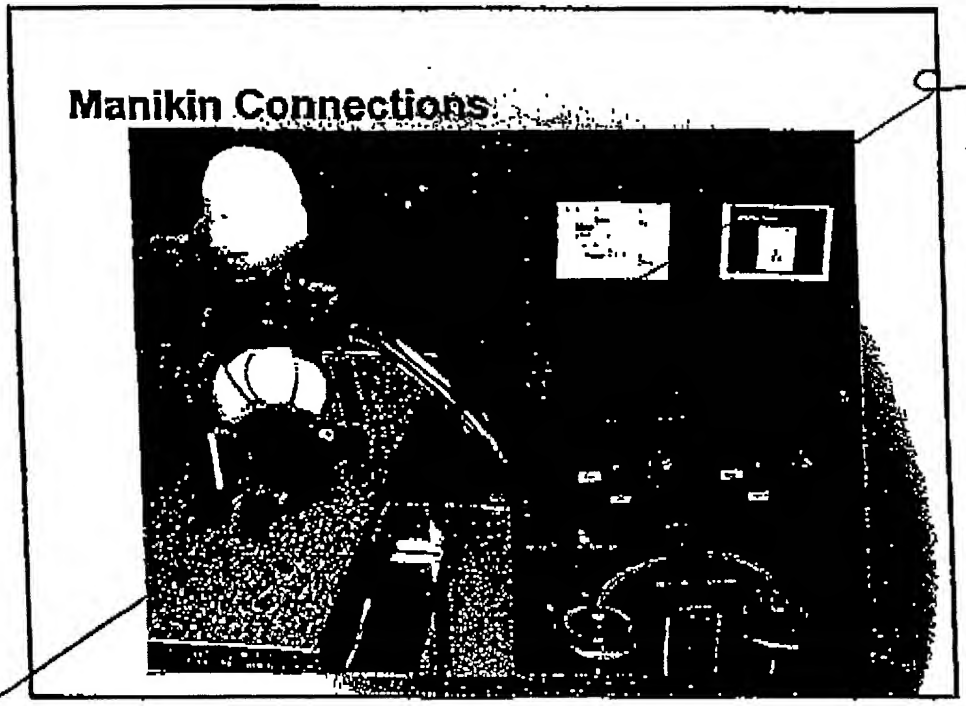

Manikin Connections
10
Internal Connections
Within Manikin
54

FIG. 8


Manikin Connections